COUNCIL AGENDA: 3/3/15
ITEM: 7.2

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Memorandum

TO: HONORABLE MAYOR AND CITY COUNCIL

FROM: Kerrie Romanow
Barry Ng

SUBJECT: **SEE BELOW**

DATE: February 25, 2015

Approved D-DSyL Date 2/26/15

SUBJECT: RESOLUTION OF THE SAN JOSE CITY COUNCIL DECLARING AND FINDING THAT PUBLIC INTEREST AND NECESSITY DEMAND THE IMMEDIATE PROCUREMENT AND AWARD OF ENGINEERING AND CONSTRUCTION CONTRACTS TO PERFORM EMERGENCY REPLACEMENT OF POND A18's NORTHERN GATE STRUCTURE LOCATED AT THE SAN JOSE/SANTA CLARA REGIONAL WASTEWATER FACILITY WITHOUT COMPETITIVE BIDDING

REASON FOR ADDENDUM

This item is being forwarded to City Council for consideration at its earliest opportunity due to the nature of this emergency. The analysis contained in this memorandum has been prepared based on the latest information available and is critical in informing the City Council as to the nature and severity of the emergency, and of the most expedient manner to remedy it. A delay in the approval and procurement period will limit the City's ability to address the situation and avoid potentially catastrophic consequences.

RECOMMENDATION

1. Accept the staff report detailing the current status of the San José/Santa Clara Regional Wastewater Facility's Pond A18's northern gate structure, the likelihood for failure, the consequences of failure, and the plan for immediate action to remove and replace the structure.
2. Adopt a resolution by four-fifths of the City Council as required by California Public Contract Code 22050:
   a. Declaring and finding that, based on substantial evidence, public interest and necessity demand the immediate procurement and award of engineering and construction contracts to perform emergency replacement of the San José/Santa Clara Regional Wastewater Facility's Pond A18's northern gate structure without competitive bidding and that the

emergency replacement will not permit a delay resulting from a competitive solicitation for bids, and that the action is necessary to respond to the emergency; and

b. Delegating authority to the Directors of Environmental Services and Public Works to negotiate and award the engineering and construction contracts necessary to replace the northern gate structure in order to protect Pond A18 and levees in an amount not to exceed $1,000,000.

OUTCOME

Approval of this recommendation by the City Council will enable staff to immediately take actions necessary to protect property and the environment by performing an immediate and complete replacement of the Pond A18 northern gate structure.

EXECUTIVE SUMMARY

Pond A18 is owned and managed by the San José/Santa Clara Regional Wastewater Facility. It is surrounded by levees and the flow of water is managed by two hydraulic gate structures. A recent condition assessment report has identified a number of critical issues at the northern gate structure that, if not addressed immediately, places the structure at risk of failure, leading to a breach of the levee. The most expedient way to replace this structure, and minimize the risk, is for City Council to make a finding that this constitutes an emergency situation such that the immediate procurement of engineering and contracting services are necessary to respond. This report is intended to provide the City Council with the information necessary to make that determination.

BACKGROUND

Pond A18 is a former salt pond that was purchased by the San José/Santa Clara Regional Wastewater Facility[1] (RWF) in 2003. Prior to being purchased, the pond was operated as a salt evaporation pond by Cargill, Inc. as part of their salt production process. Water was pumped into the pond through a siphon that ran under Artesian Slough and the western levee. High salinity water in A18 was then pumped out of the pond through a second siphon into other salt evaporation ponds to the north. This series of impoundments increased salinity at each step.

Pond A18 is located on the northwestern section of RWF lands and is approximately 856 acres in size. It is surrounded by levees, only a portion of which are "engineered". Approximately three-

[1] *The legal, official name of the facility remains San José/Santa Clara Water Pollution Control Plant, but beginning in early 2013, the facility was approved to use a new common name, the San José-Santa Clara Regional Wastewater Facility.*

quarters of the levee system is dredged bay mud that has compacted on its own over time, is easily eroded, is not accessible to vehicles when moist or wet and requires ongoing maintenance in order to provide containment of the pond waters and flood protection for the RWF and land/property south of Pond A18.

The RWF operates Pond A18 under its own Waste Discharge Permit (#R2-2005-0003), which requires that the pond maintains adequate water levels to control odors, dissolved oxygen, and erosion of the interior (southern) levee. Exchange of water between Pond A18 and the San Francisco Bay is accomplished via two hydraulic control structures along the levee bounding the western edge of the pond that were installed as part of the purchase agreement with Cargill. These bay front structures are constructed of timber products and each structure has two 48-inch plastic pipes (for a total of four pipes) with 1-way slide/flap-gate valves on either end of the pipes, allowing staff operational flexibility to managing water and water quality within the pond. The hydraulic control structures are commonly referred to as "gate structures". Both the northern and southern hydraulic control structures are in excess of 11 years old and are nearing the end of their designed life.

ANALYSIS

City crews have been performing routine maintenance work since the gate structures were installed in 2004. Increased maintenance efforts began in 2011 to combat erosion damage, mechanical issues and structural damage which appeared to be accelerating due to the age of the timber members, and exposure to the natural elements. A capital improvement project has been initiated to replace both gate structures, along with the Artesian Slough outfall bridge, in three to four years, following an anticipated lengthy environmental permitting process. Funds have been appropriated in the current 5-year Capital Improvement Program, and work has begun to scope and schedule the project. As an initial step in developing the project, an engineering condition assessment was completed in January 2015, with underwater divers and structural engineers providing observations, measurements, and detailed analysis.

Existing Condition and Likelihood of Structural Failure

The results of the condition assessment study concluded that the northern gate structure (NGS) is in critical condition and at risk of failure due to substantial subsurface erosion and the deterioration of several timber piles. Much of this damage was not evident or visible until divers were able to physically observe the extent of the failure.

Two of the three timber piles (12 inches in diameter, approximately the size of wooden utility poles) that support the headwall located on the slough side have failed below the normal tidal water level due to excessive horizontal loading. Significant bending and cracking of the horizontal timber supports is visible above water, and is projected to worsen or fail completely as the horizontal loads increase due to consolidation and densification of backfill material. Several of the below water-level horizontal timber supports have failed and provide minimal structural

support. It is important to note that these failure modes are more closely linked to overstressing rather than deterioration.

Significant undermining and backfill material loss was observed underwater, which has resulted in levee settlement and material loss above the waterline. This migration and loss of levee backfill material worsens with each tide, and is exacerbated by turbulence and scour created when water flows into or out of the pond through the twin 48" pipes. Scour depressions were observed extending up to ten feet underneath the pipes contained in the levee, signifying significant material loss under the entire structure. Recent rain events have also softened the backfill material from above and helped facilitate further erosion and loss of material.

The slide/flap-gate valves on the pipes are no longer working properly and are impacting the controlled movement of water to and through the pond. Both slough-side gates will not close completely, allowing some tidal water to enter the pond during high tides, whether desirable or not. The shifting of the timber structure above the pipes has caused significant strain and torque on the slide/flap-gate valve mechanisms, making them difficult to operate. Maintenance crews have performed numerous repairs to relieve strain on the valve screws and to clean marine buildup on the slide/flap-gates and slide mechanisms. With reduced ability to control the movement of water between the slough and the pond, maintaining appropriate water quality in the pond to protect fish and wildlife is uncertain and may lead to poor water quality conditions, especially as average temperatures increase with the upcoming summer. The risk of violating permit conditions is heightened with the current limited operational flexibility.

The southern gate structure, while aging, is still operational, though not in good condition. Environmental conditions at the southern gate structure's location, while present, are not as severe as those surrounding the NGS. Minimal repairs can be performed by maintenance crews in order to maintain operations until the CIP project can perform a complete removal and replacement in 2018.

Recent storms and high tidal movement resulted in increased water movement between the slough and ponds, putting additional stress on the scoured and eroded gate structures. However, the condition assessment report has indicated that continued erosion and material migration could lead to a sudden loss of the NGS, especially during a seismic event. The condition assessment report, also confirmed by visual observations from City engineering staff, classified the NGS as critical. It is this potential for failure that causes the highest concern and the need for immediate action.

Consequence of Structural Failure

The most likely mode of failure for the NGS would be the sudden collapse of the slough-side headwall and wingwalls due to the horizontal stress, fatigued timber members and scour beneath the pipes. Loss of the headwall would tear the slide/flap-gate valves off of the ends of the 48-inch pipes, leading to a direct and unregulated movement of water, fish and wildlife through the open pipes. The turbulent action of sudden and uncontrolled flow through the open pipes would

quickly lead to total failure of the non-engineered levee section causing a breach of the western levee at this location. A breach in this area would likely widen to over a hundred feet wide in a few tide cycles, similar to what occurred when a salt pond to the north was intentionally breached as part of a Santa Clara Valley Water District mitigation project in 2006 (Pond A21).

Under a breach scenario, Pond A18 would be open to the Bay and tidal action and there would be no hydraulic control of pond discharges or pond water levels. This means that tidal flood protection is now shifted from the western and northern levees to the southern levee, which is not engineered, is in the poorest condition, and has the lowest top of levee elevation of all of the levees surrounding the pond. On February 19 and 20, 2015, staff observed that the water surface elevation inside the pond has risen to the highest level recommended in the A18 Operations Plan, yet remained approximately 2.5 feet below the high point of the tide on the slough side of the gate structure. Failure of the NGS would allow the pond water height to reach levels similar to those experienced in the slough side, which in turn would create critical risk to the southern levee.

To illustrate this critical risk, the recent high tides in South San Francisco Bay would result in water elevations reaching within inches of overtopping the southern levee, and with any wind generated wave action, overtopping would have occurred. If the southern levee experiences overtopping or failure (a new breach), tidal influence would spread to the south of Pond A18 and begin impacting the sludge lagoon slopes, the eastern levee of the RWF outfall channel, and come within 600 feet of Los Esteros Road, near the ZWED offices entrance. The threat to the RWF and adjacent land/property south of A18 would be severe and is difficult to estimate at this time.

Beyond the threat to the lands south of the pond, the Pond A18 facility itself is a valuable asset worth protecting. The 856-acre pond is a major asset and potential resource for negotiating flood protection improvements associated with the proposed U.S. Army Corps of Engineers Shoreline Levee Project, which will eventually follow the pond's southern levee. Should the NGS situation deteriorate further and a breach of Pond A18 occur, the City would be forced into immediate action to repair the breach and gain control of the property, or count the pond as a total loss and begin construction efforts to bolster the southern levee to prevent a second breach. In either case, the City will expend considerable resources and funds to protect critical infrastructure and assets.

Proposed Removal and Replacement

The general consensus among consultant structural engineers and City engineering staff is that there is no repair option that would extend the life of the NGS or reduce its potential for failure while the current CIP process moves forward. There are simply too many degraded and critical issues to fix them all. Installing new materials and attaching them to worn and decomposing materials would not provide meaningful or cost effective service life to the existing structure. It is likely that attempts at repair could actually trigger a loss of the structure. A complete removal

and replacement would offer the most effective means to prevent failure and provide significant service life.

The contemplated work involves installing two temporary sheet-pile dams on either side of the NGS (one in the slough and one in the pond). Installation of the temporary dams will immediately stop the ongoing erosion, and allow for a safe, drained area for the reconstruction activities to take place. Once the gate, structure, pipes, headwalls, wingwalls, trash racks and slope stabilization are complete, the temporary dams will be removed and the hydraulic control of the pond can be re-established.

State Public Contract Code Section 22050(a)(1), which the RWF is subject to, states:

> "In the case of an emergency, a public agency, pursuant to a four-fifths vote of its governing body, may repair or replace a public facility, take any directly related and immediate action required by that emergency, and procure the necessary equipment, services, and supplies for those purposes, without giving notice for bids to let contracts."

Before the governing body takes any action pursuant to Section 22050(a)(1), it shall make a finding that, based on substantial evidence set forth in the minutes of the meeting that the emergency will not permit a delay resulting from a competitive solicitation for bids, and that the action is necessary to respond to the emergency. The recommended City Council action will allow staff to immediately procure engineers and contractors as appropriate to begin work without undergoing a sequential process of design consultant procurement followed by a contractor procurement. The sheet-pile dam installation is most critical at this point as it will provide immediate flood protection should the NGS fail. Staff recommends that this work begin immediately. The sheet-pile dam installation and structure design can occur simultaneously, along with material and equipment procurement. This expedited approach offers the most efficient, expedient and complete solution.

Regulatory Compliance and Permitting

The pond is currently operated in compliance with the Regional Water Quality Control Board permit. The Regional Board is aware of the pond's condition, and they are supportive of the City's proposed plans to repair and replace the NGS. The U.S. Fish and Wildlife Service is also aware of the situation, and has shared that they have experienced similar, rapid gate failure in the past on their ponds as well. City staff have coordinated with management staff from the Santa Clara Valley Water District and has received their full support as well. Staff has prepared an application for an emergency permit from the U.S. Army Corps of Engineers to conduct the immediate repair/replacement. Under an emergency permit, work may begin prior to permit approval in order to avoid or minimize damage to the environment. Staff will work with regulatory agencies to quickly issue the necessary permits while proceeding with work.

Based on the analysis above, staff has determined that an emergency exists and proposes that the recommended action be taken by the City Council in order to immediately begin the procurement

of the necessary engineering and construction expertise and skill to replace the NGS and protect the levees and Pond A-18.

EVALUATION AND FOLLOWUP

Staff will prepare an informational memo to the City Council every 14 days (in compliance with Public Contract Code Section 22050) providing a status of the actions taken and the progress of the emergency work until the work has been completed and the emergency action terminated.

POLICY ALTERNATIVES

Alternative #1: Do not find an emergency exists and proceed with regular design-bid-build procurement.
Pros: Familiar procurement process with competitive bidding. May be able to use existing consultant agreements to perform design work.
Cons: Does not permit immediate engineering and installation of the protective dam structures. Contractor procurement will take up to three months and regulatory permitting will likely take over 6 months to secure, possibly up to 24 months. Delays associated with permit acquisition would result in missing the upcoming construction season, when dry weather conditions will allow for construction equipment, vehicles and materials to gain safe access to this remote site.
Reason for not recommending: Delaying the installation of the dams will leave the NGS vulnerable to failure. Traditional procurement will lengthen the time that the pond gates are not operating as designed, possibly leading to stagnant water in the pond and creating odors.

PUBLIC OUTREACH

This memorandum will be posted on the City Council's Agenda for the March 3, 2015 Council Meeting. The status of the NGS has been shared with the Treatment Plant Advisory Committee on February 12, 2015.

COORDINATION

This memorandum has been coordinated with the City Attorney's Office, the City Manager's Budget Office, Office of Emergency Services, Risk Management and Department of Planning, Building and Code Enforcement.

COST SUMMARY/IMPLICATIONS

The complete removal and replacement of the NGS is expected to cost less than $1,000,000. Funding is available for urgent and unscheduled needs as described below.

BUDGET REFERENCE

The table below identifies the fund and appropriation that will fund the contract recommended as part of this memorandum.

Fund #	Appn #	Appn. Name	Total Appn.	Amount for Contract	2014-2015 Adopted Budget (Page)	Last Budget Action (Date, Ord. No.)
512	7395	Urgent and Unscheduled Treatment Plan Rehabilitation	$2,809,000	$950,000	V-205	10/07/2014 Ord. No. 29496

CEQA

Exempt, File No. PP15-015, CEQA Guidelines Section 15302, Replacement or Reconstruction.

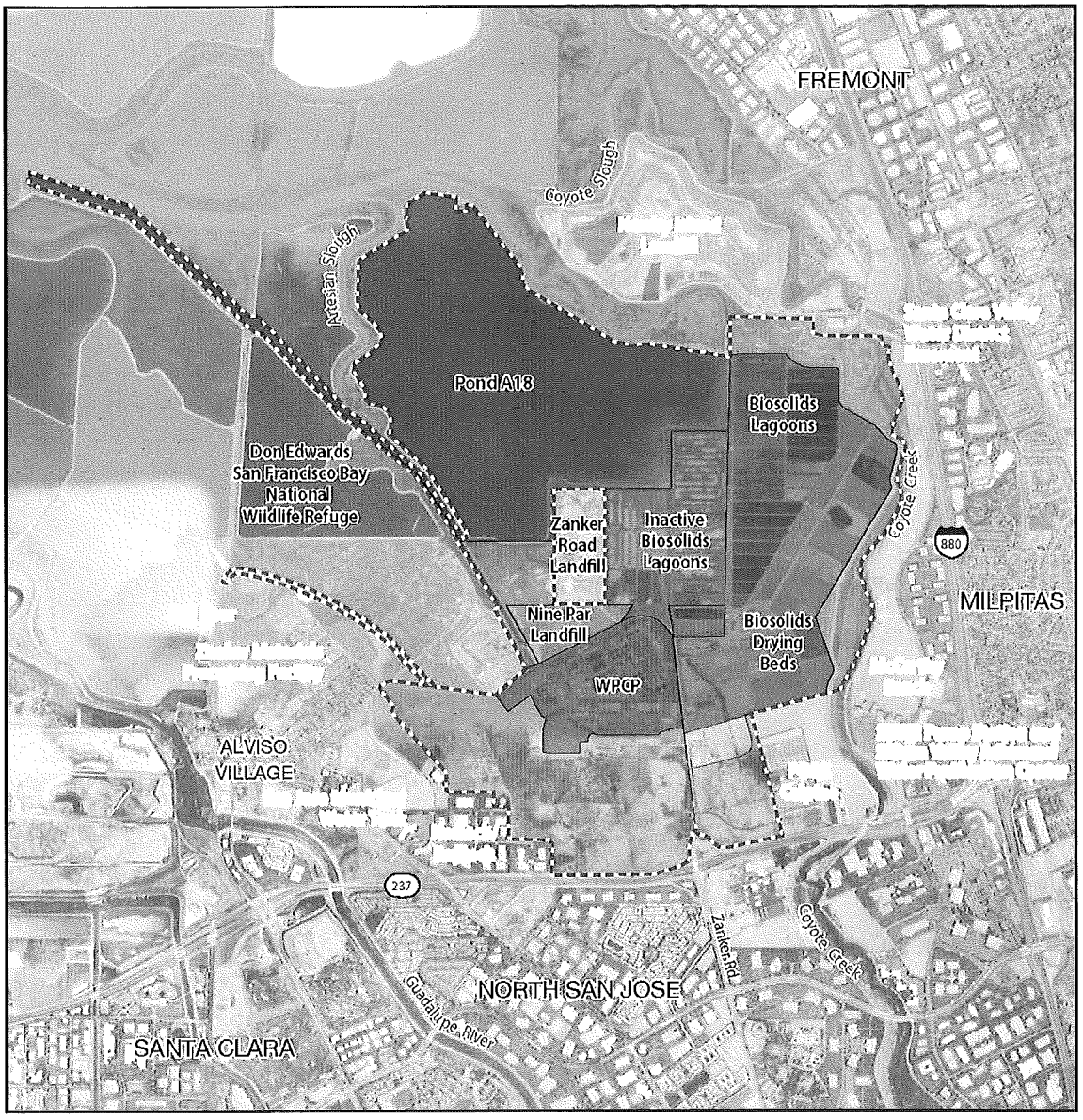
/s/
KERRIE ROMANOW
Director of Environmental Services

/s/
BARRY NG
Interim Director of Public Works

For questions, please contact John Cannon, Principal Engineer, Department of Public Works at (408) 535-8340.

Attachment A – Location Maps

ATTACHMENT A-1
LOCATION MAP



Legend

- Project Boundary
- Residual Solids Management Area
- Water Pollution Control Plant Operational Area
- Bufferlands
- Salt Pond A18

SBWR South Bay Water Recycling
WPCP Water Pollution Control Plant

0 1
Mile

SOURCE: ESA | J&S

San Jose/Santa Clara WPCP Master Plan
Figure 2-2
Site and Vicinity

ATTACHMENT A-2
DETAILED MAP